

Rheocasting an engine mounting bracket in commercial 7075

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Abstract

Wrought aluminium alloys are prone to hot tearing when cast into near-net shapes. This problem can be overcome by the novel casting technique of rheo-processing combined with high pressure die casting. An industrial engine mounting bracket is produced by rheo-process commercial 7075 with the patented CSIR-RCS and subsequent high pressure die casting. Section thickness changes and constraining geometry make this a difficult component to rheocast. X-ray radiography is used to evaluate hot tearing over the component and is correlated to piston injection shot profile velocities. Gross hot tearing is significantly reduced by a higher injection velocity but turbulent flow entraps air. Faster injection allows more time for flow before final solidification.